CHAPTER 5. POINT SOURCE/POINT SOURCE AND INTRA-PLANT TRADING

Point/point source trading *involves two or more dischargers, enabling one facility, in lieu of upgrading its own pollution controls, to arrange for greater than required controls at a second facility that can further reduce pollutant loads more cost-effectively.* ***Intra-plant trading*** *allows a single facility that maintains multiple outfalls to allocate pollutant discharges among them in a cost-effective manner.*

Introduction

Both point/point source trading and intra-plant trading involve trading between point sources. The Clean Water Act (CWA) defines a point source as "any discernible, confined and discrete conveyance ... from which pollutants are or may be discharged." Point/point trading involves two or more facilities, and intra-plant trading involves only one.

Point/point and intra-plant trading are unique among types of trading discussed in this framework in that all potential trading parties are subject to the same regulatory regime—National Pollutant Discharge Elimination System (NPDES) permits. As a result, many issues related to these trades are relatively straightforward and/or are addressed according to established protocols, compared to other types of trading. Nonetheless, site-specific water quality conditions and effluent characteristics of the particular trading partners involved will determine whether contemplated trades warrant any special considerations, analyses, or administrative arrangements to supplement NPDES permits.

Additionally, even though point sources are regulated by the same permit program, the cast of potential trading partners in any watershed or segment can be quite diverse. A watershed*s point sources could include discharges from municipal treatment plants, industrial facilities, federal facilities, active and inactive mines, and large concentrated animal feedlots, as well as any stormwater collected and discharged through a discrete outfall. The diversity of point sources in a watershed can create opportunities for trading, as illustrated in Exhibit 5.1.

Effluent characteristics, economic incentives, treatment options, financial capabilities, experiences with permit authorities, and/or familiarity with other

EXHIBIT 5.1: POINT/POINT TRADING SOUTH SAN FRANCISCO BAY

The San Francisco Regional Water Quality Control Board directed three POTWs and a stormwater management agency to negotiate how together they could achieve a 900-pound-per-year reduction in copper loadings needed to meet TMDL allocations. The 900 lb/yr reduction target exceeds reductions San Jose, Palo Alto, and Sunnyvale POTWs and the Santa Clara Valley Nonpoint Source Pollution Control Program have already achieved to meet their WLAs. The four parties will report back to the Board to specify how the additional reduction target will be met, including identifying specific responsibilities. Options include point/point trading between some or all parties.

Source: USEPA Region 9, personal communication, October 1995.

permittees will differ among point sources. When trading involves more than one type of point source, such differences might require some attention.

5.1 Regulatory Issues

Both point/point source trading and intra-plant trading may help achieve water quality standards when technology-based discharge limits are insufficient to do so. Under point/point source trading and intra-plant trading, all point sources would still meet technology-based requirements. The only instance in which EPA has authorized an intra-plant trade to meet technology-based requirements is in the iron and steel industry. (See Appendix B.) It is unclear whether future effluent guidelines will allow this form of intra-plant trading.

Beyond technology-based requirements, dischargers would be free to exchange pollution reduction requirements between outfalls, subject to criteria established by permit authorities. In point/point source trading, municipal and industrial facilities could buy and sell or otherwise exchange pollution reduction requirements, provided that resulting changes in allowable discharges are consistent with water quality standards and comply with the principles identified in Chapter 2. Revised limits are then incorporated into dischargers* permits by the permitting authority.

In intra-plant trading, a facility with multiple outfalls could negotiate revised permit limits with the permit authority, enabling it to allocate its total pollutant load across outfalls in a cost-effective manner while attaining water quality standards and complying with other trading principles.

As noted in the Executive Summary and Chapter 2, both point/point source trading and intra-plant trading take place within the context of the NPDES program. Like conventional NPDES permits, permits for point sources engaged in a trade contain specific effluent limits for each outfall. These limits must reflect the results of any trade.

In addition, terms of trades can be documented in the special conditions section of permits and incorporated into permit compliance schedules, though additional monitoring may be required. Incorporating results of trades into NPDES permits for each involved facility will ensure that permittees are clearly accountable for compliance. NPDES permits may be issued in the context of a total maximum daily load (TMDL). (The role of TMDLs in trading is discussed in more detail in Chapter 7.)

In addition to documenting trades in effluent limits, NPDES permits issued to point sources engaged in trades must be developed in a manner consistent with the anti-degradation policy and anti-backsliding requirements of the CWA. The implications of these requirements for trading are described below.

Anti-Degradation Policy

The extent to which point/point trading can enhance compliance with a state anti-degradation policy depends on whether receiving waters in question are Tier 1, 2, or 3. The implications of anti-degradation policies for trading also will depend on each state*s approach. It will be necessary to ensure compliance with the specific requirements of the state*s anti-degradation policy before enacting a trade.

- For waters where water quality is not better than fishable/swimmable (Tier 1), trading can be incorporated into the development of a new TMDL, providing a means of reducing pollutant loads, attaining water quality standards, protecting existing uses, and/or improving water quality to a Tier 2 level at less cost.

- For waters that are better than fishable/swimmable quality (Tier 2), point/point source trading might offer a means of accommodating important economic or social development and result in less degradation than a non-trading option, and/or provide other benefits to the community (e.g., lower wastewater treatment rates). In these areas, new dischargers could trade with existing dischargers to reach a cost-effective reallocation of pollutant loads.

- Similarly, for Outstanding Natural Resource Waters (Tier 3), trading might be the only means of accommodating new dischargers, provided that current high levels of water quality will be maintained.

Anti-Backsliding Requirements

CWA anti-backsliding requirements are met by point sources trading in waterbodies that are newly water-quality-limited, or where wasteload allocations (WLAs) are being revised downward. In such cases, point sources face loading reduction requirements above what they are already achieving. Point sources buying loading reductions could continue discharging at current limits with permits no less strict than those in place before trading. Point sources selling reductions end up with stricter limits.

The CWA, however, allows backsliding from a water quality-based effluent limit (WQBEL) in two situations:

1. Where a waterbody is not attaining its water quality standard, a limit may be relaxed only if a TMDL or WLA has been performed establishing a new limit and implementation of that TMDL/WLA will ensure compliance with water quality standards.

2. Where a waterbody is attaining its water quality standards, a limit may be relaxed only if requirements of the anti-degradation policy are being met.

Most trades will allow a point source to meet new pollutant reduction requirements more cost-effectively by arranging for treatment by another source. If a trade is implemented through a TMDL, a point source might receive a reduced WQBEL as a result of the trade. A reduced WQBEL would be part of a suite of pollution controls that would attain water quality standards.

Reopener Clause

As a further protection against the possibility that trading might cause adverse water quality effects, permitting authorities can invoke a reopener clause in any NPDES permit. This clause gives permit agencies the power to alter discharge limits at any time during the life of a permit if in-stream surveys, improved water quality modeling, or other factors indicate that a modification is necessary.

5.2 Economic Issues

The economic benefits of point/point source trading and intra-plant trading can be substantial. While experience to date

with point/point source trading is limited, EPA estimates that potential pollution control cost savings associated with this form of trading might reach as high as $1.9 billion per year, according to an analysis of benefits and costs prepared for President Clinton*s Clean Water Initiative (USEPA, Office of Water, March 1994, EPA 800-R-002). Similar national estimates for intra-plant trading are not available.

Unit Cost Differences

Dischargers* motivation to trade will be strongest when the potential cost savings associated with trading are high. As discussed in Chapter 3, cost savings are possible when incremental costs of reducing pollution differ from source to source. In the case of point sources, differences in incremental costs might arise for a number of reasons.

Economies of scale—the tendency for average pollution control costs to fall as volumes of effluent to be treated increase—are one common factor. As noted in the introduction to this chapter, many types of point sources can exist within a watershed. Some types tend to discharge much greater amounts of effluent than others. For instance, a large wastewater treatment plant is likely to discharge higher volumes of effluent than a small paper mill. This situation creates opportunities to take advantage of economies of scale. The same situation also can exist for a single plant (i.e., intra-plant trading) in cases where a plant has outfalls that discharge varying volumes of effluent.

Another factor that is likely to create differences in incremental control costs is a tendency for the cost-effectiveness of pollution control to diminish as levels of control become more stringent and more sophisticated and expensive technologies are required. As a result, it might be more expensive per unit to reduce the effluent concentration of a pollutant from 2 mg/l to 1 mg/l than to reduce the concentration from 20 mg/l to 2 mg/l.

Potentially, point sources in a watershed differ significantly in the level of treatment currently achieved. Even though they all operate under the NPDES regulatory system, differences in technology-based requirements among different industries might result in different pollutant concentrations. Additionally, age of facility and treatment processes are factors in relative current pollutant loadings among dischargers.

Transaction Costs

As discussed in Chapter 3, transaction costs (the costs incurred in identifying potential partners, negotiating and documenting a trade, and soliciting and maintaining regulatory approval for a trade) can significantly affect trading. Methods available to reduce transaction costs can involve some level of governmental and/or private action (e.g., clearinghouse, facilitator). Since point sources are already regulated under the NPDES permit system, government agencies and industries may prefer a more market-like approach to trading that avoids significant government roles beyond the NPDES process.

Other Economic Considerations

A number of other economic considerations may influence point sources* interest in trading. Many point sources are profit-seeking businesses that work within the setting of the market

economy. Given this setting, interest in trading might depend not only on the absolute magnitude of potential cost savings (net of all transaction costs), but also on the relative size of those savings compared to overall operating costs (e.g., total production costs for an iron and steel manufacturer). If the benefits of trading outweigh associated costs, but returns on investments in trading have little overall impact on a discharger*s total operating costs, the discharger might choose to devote its limited resources to endeavors that promise greater returns.

Further, trading programs might be most successful when they are organized to include a range of industries, or when neutral parties broker trades. Firms in the same industry could be reluctant to share sensitive information due to competitive pressures.

Point sources subject to financial regulations might face economic incentives for a particular trading scenario that are different from those of unregulated sources. An example of a financially regulated point source is a POTW that charges rates approved by a public utilities commission. Such POTWs undergo review processes in which commissions verify the authenticity of POTW-reported costs. The review process keeps POTW rates in line with costs.

Because such POTWs have to justify all costs and expenditures to be able to charge a given rate, they will want to discuss potential participation in a trading program with the appropriate utility regulator. Some rate boards might be averse to POTWs' participating in a new program such as trading; other rate boards might encourage trades if they are economically justifiable. Specific questions include whether a rate board would allow a POTW to pay another source for loading reductions credited to the POTW (POTW as buyer), and whether a rate board would allow a POTW to overcontrol and sell a portion of its additional reductions to other sources (POTW as seller).

For example, when EPA*s Chesapeake Bay Program identified potential point/point trading opportunities among six POTWs discharging to the lower Potomac River, several plants raised concerns about how they could incorporate trades into their capital planning process. Many operators felt that their rate boards and the public would view even a partial reliance on trading as risky, given the need to make financial investment decisions for future plant operations well in advance of an actual need for additional capacity or treatment capabilities.

5.3 Data-Related Issues

Dischargers and permitting authorities will be interested in obtaining a range of data in order to implement a trading program. To formulate a trading proposal, dischargers need information on current or proposed permit limits and pollution reduction goals; current pollutant discharges; and the cost, applicability, and effectiveness of alternative pollution control methods. To assess the acceptability of potential trades, dischargers also may want to evaluate potential effects of alternative discharge limits on water quality.

With the exception of cost data, permitting authorities will need similar information to evaluate proposed trades. Cost data may also be of value to permitting authorities if their interests include tracking the economic benefits of trading. This information might be particularly useful,

for example, in documenting the accomplishments of an agency*s trading program and encouraging other agencies to initiate similar efforts.

EPA maintains a number of databases that can provide useful information in support of trading programs. For example, EPA*s Permit Compliance System maintains information on current pollutant loadings and permit limits. Similarly, the STORET system and EPA*s Waterbody System can provide information on water quality conditions, and the Agency*s Treatability Database is a source of data on applicable treatment technologies. These centralized sources might not, however, contain the most current information available or provide sufficient detail on site-specific conditions. Potential sources of more detailed and current information are described below.

Current or Potential Future Permit Limits

Some of the information that will support trading is readily available from public sources. For example, NPDES permits specify current permit limits, and information on these limits can be obtained from the permitting authority. Also, permitting authorities may publish documents related to TMDL development and proposed wasteload allocations that provide information on potential pollution reduction requirements beyond technology-based requirements and water quality impacts. More general data on applicable water quality standards should be available from the local permitting authority, the states, or EPA.

Loadings

Data on current point source loadings, like information on current or proposed permit limits, can usually be obtained from public sources—in this case, NPDES permittees* Discharge Monitoring Reports (DMRs). Dischargers typically file these reports on a monthly basis, providing data on effluent flows and the concentrations of each pollutant in their discharge that their permits require them to monitor. In some cases, DMRs might not include data on all pollutants of concern. Supplemental information might be obtained as part of the TMDL development effort or through special monitoring studies.

DMR requirements are a main difference between point/point and other types of trading with respect to data availability. DMRs provide by far the most complete pollutant release information in any medium and for any source. Furthermore, DMRs contain actual releases, rather than permitted releases, as some forms of reporting do. As a result, DMR provides a better picture of the real world than permits alone.

Control Options

Both dischargers and permitting authorities can obtain general information on the cost, applicability, and effectiveness of alternative pollution control methods from EPA effluent guideline development documents and similar sources, as well as from trade associations and other industry organizations. These sources, however, are designed primarily to provide rough estimates of the cost or effectiveness of alternative methods, not to provide detailed assessments for application to a particular facility. To avoid mischaracterizing the cost-effectiveness of control options available to them, dischargers or other interested parties can complete more detailed, plant-specific assessments before proposing a trade.

In conducting such assessments, dischargers are encouraged to consider pollution prevention practices as well as end-of-pipe treatment. In many situations, pollution prevention can be more cost-effective than end-of-pipe treatment in achieving pollution reduction goals. Facilities that explore pollution prevention opportunities might be better positioned to discharge at lower levels than those set in the NPDES limits they would have had in the absence of trading and to offer pollution reductions in trades with other dischargers. State and EPA regional pollution prevention coordinators might prove to be a good source of pollution prevention ideas.

Water Quality Impacts

An assessment of trading water quality impacts might involve water quality modeling and analysis. Data needed for such efforts will depend on the sophistication of the analyses, the pollutant(s) involved, and the nature of the receiving waters.

If trading is integrated into TMDL development processes, the analytic effort should be no different than that ordinarily required. If trades are negotiated following initial development of TMDLs, permitting agencies will likely evaluate proposed trades—or ask dischargers to evaluate proposed trades—using analytic techniques like those employed in developing the original TMDLs. If this is the case, data requirements for trading analyses should be similar or identical to those for the original TMDL efforts. Additional data should be necessary only if permitting authorities employ specialized approaches to analyze proposed trades.

Even so, several typical data gaps are notable and might necessitate special sampling. For example, despite an abundance of effluent data, little documentation of ambient water quality downstream from point sources exists. Additionally, mixing zone data are especially rare.

5.4 Technical and Scientific Issues

As noted earlier, technical and scientific issues facing point/point and intra-plant trading revolve around the fact that such trading produces additional load reductions at sellers* outfalls rather than at buyers' outfalls, where additional reductions would otherwise occur. As a result, assessing trading effects at the edge of mixing zones and downstream is a key part of any water quality analysis for trading.

Point source discharges must meet permit limitations. If the permit limit is based on the protection of the water quality rather than technology-based effluent guidelines, the limit is probably based on meeting water quality standards at the edge of the mixing zone. Mixing zone effects, as well as downstream effects, depend in part on spatial, temporal, and chemical differences between trading partners* loads.

Local Conditions

A key factor in evaluating trades is the need to ensure attainment of water quality standards and protect against adverse effects on the aquatic environment in the immediate vicinity of a point source outfall. This is a special concern in the case of pollutants that do not degrade or decay, such as metals, as well as with other pollutants that can bioaccumulate, with resulting toxic effects on aquatic life.

Careful analysis of such trades, including the potential impacts of spatial or temporal variations in loadings, will be necessary to ensure that the creation of local "hot spots" or "dead zones" is avoided. To facilitate this type of analysis, procedures for conducting local water quality evaluations can be based on those which permitting agencies currently employ in establishing water quality-based effluent limits (i.e., current state or regional policies on the use of mixing zones and the application of acute vs. chronic water quality criteria).

Spatial Considerations

The effect of trades on water quality will depend, in part, on where trading partners are located relative to each other in watersheds and segments. Distances between partners and existing water quality conditions (e.g., assimilative capacity, levels of non-traded pollutants) at, near, and between traders* outfalls are factors in how well additional reductions at sellers* outfalls will maintain or improve overall water quality in the area of concern.

Temporal Considerations

Many point source loads are relatively constant and predictable over time, as allowed by their NPDES permits. Among the different types of point sources, and even among same-type point sources, however, temporal characteristics of loads can vary dramatically. For example, loadings from combined sewer systems and sanitary sewers with inflow are highly influenced by rainfall. Feedlot and stormwater loadings also are weather-dependent. Loadings from other types of point sources, such as industrial dischargers and mining operations, can vary according to production cycles and processes. A given unit of pollutant will also have different water quality impacts, depending on the flow and temperature of receiving waters at particular times.

Several simple analytical techniques can help compare loads from different sources. Calculating daily, monthly, or annual average loadings (whichever period is most appropriate) is one approach. More sophisticated analyses involving time series data are also options. Such comparisons should factor in seasonal differences in loadings and/or assimilative capacity (e.g., dry seasons), as necessary.

Chemical Considerations

Chemical differences can exist between the same pollutant coming from different point sources. Point source pollutants typically reach waterbodies in dissolved form, but pollutants from sources where discharges have come into contact with land or other materials (including soils, asphalt, and other conveyances) might be attached or adsorbed to sediment. Such differences should be accounted for in water quality analyses conducted to support trading.

In reviewing proposed trades, permitting authorities might also need to evaluate the effects of trading arrangements on loadings of pollutants other than those explicitly traded, to ensure that no inadvertent violations of water quality standards result. For example, if trading of conventional pollutants shifts additional load reductions to a discharger whose effluent also contains certain toxics, the resulting effect on toxic loadings is worth examining. Permitting authorities can ask dischargers to reformulate trading proposals if the projected impact on other pollutants would threaten to violate permit conditions or water quality standards.

Addressing Considerations

A variety of tools are available to permitting authorities and dischargers to accommodate differences between trading partners* loadings and their effects on water quality. TMDL margins of safety, discussed in Chapter 7, are one approach. The use of trading ratios, introduced in Chapter 3, also can accommodate differences between loadings for the purposes of trading.

Trading ratios (also sometimes referred to as "offset ratios") may be used to guard against the creation of hot spots, to provide a margin of safety against uncertainties in water quality modeling, or even to create a buffer to accommodate future discharge growth. It is important to note, however, that the use of trading ratios can dilute or possibly eliminate incentives to trade since the costs associated with achieving more stringent control through trading might outweigh potential cost savings that would otherwise be achieved. While permitting authorities can employ trading ratios in an effort to ensure that trades result in water quality improvements, they should recognize that stringent trading ratios might eliminate the potential economic benefits of trading.

5.5 Institutional Issues

Few, if any, institutional modifications for point/point source trading and intra-plant trading programs may be necessary. Both take place within the context of the existing NPDES program, which provides a well-established framework for interaction between the permitting authority and point sources that wish to participate in a trading initiative. In addition, the NPDES program provides established procedures for inviting environmental groups and other interested parties, including the general public, to comment on proposed permit conditions. These procedures can be employed to invite public review and comment on proposed trades.

The existence of a well-established institutional framework within which point/point source and intra-plant trading can occur simplifies the implementation of these types of trading programs. Nonetheless, permitting authorities might wish to modify current procedures to facilitate trading implementation. These modifications are likely to be modest when permitting authorities adopt informal trading programs, under which they encourage dischargers to propose alternative limits as an integral part of TMDL development processes.

As outlined below, the need for new procedures might be greater if permitting authorities choose to implement a more structured program for the review and approval of trades following initial development of a TMDL. Involving all interested parties—including dischargers, local government agencies, community and environmental groups, and the general public—in the development of these procedures will give trading programs the greatest possible chance of success.

5.6 Administrative Issues

The initial design of a point source trading program involves consideration of a number of issues. These include:

- The process by which the permitting authority establishes initial pollutant load allocations among contributing dischargers.

- Whether the permitting authority will require dischargers to employ trading ratios of greater than 1:1.

These issues are discussed in more detail below.

Initial Allocation

Trades should begin with identification of the pollutants of concern, the dischargers contributing to the pollution problem, and the total reduction in pollutant loads needed to meet water quality standards. This can be accomplished through the development of TMDLs and/or WQBELs. Once the state (or, if EPA disapproves the state*s TMDL, EPA) determines the TMDL for a specific pollutant, load reductions needed to reduce pollution to levels established in the TMDL are allocated among the contributing sources.

The initial allocation can have a significant effect on the economic positions of potential participants in a trade since it establishes discharge limits with which a source must comply if it cannot trade for additional discharge credits. All other factors being equal, the more expensive it will be for a source to comply with its initial allocation, the more the source will likely be willing to pay to acquire pollution reduction credits from other dischargers. Nevertheless, a discharger that can inexpensively comply with its initial allocation could be well-positioned to invest in additional pollution controls, thereby creating pollution reduction credits that it could trade to other dischargers.

Permitting authorities have several options in establishing an initial allocation prior to trading. From an administrative standpoint, a simple and equitable option is to allocate loads in a manner that is consistent with standard wasteload allocation procedures, such as requiring all dischargers to achieve a proportional reduction in current loads.

These procedures can vary significantly across states and EPA Regions. EPA*s *Technical Support Document for Water Quality-based Toxics Control* (EPA/505/2-90-001, March 1991) lists 19 allocation methods and indicates that regulatory agencies can apply any other strategy that meets applicable legal requirements. Under current practice, however, most states or EPA Regions allocate loads to dischargers using methods that impose similar effluent limits or require equivalent reductions in pollutant loads.

Based on initial allocations, the state can work with dischargers to determine if any point/point trades are appropriate.

Program Operation

Once the basic design of trading programs is defined, it will be necessary for permitting authorities to establish standard operating procedures. In particular, permitting authorities will need to establish conditions, standards, and procedures for:

- Submitting proposed trades for the authority*s consideration.
- Evaluating proposed trades.
- Establishing appropriate timeframes for review and approval/disapproval of proposed trades.
- Incorporating approved trades into permits and TMDLs.
- Ensuring public participation in trading program development and implementation.

For example, permitting authorities should specify information that dischargers will be required to include in trading proposals, as well as the form in which proposals should be submitted. In some situations, this may include asking dischargers to develop water quality analyses to support their trading proposals, and to provide documentation of approved analytic methods and results as part of their submission.

If permitting authorities make this request, they should identify in advance any recommended methods and standard assumptions (e.g., the minimum flow condition to be employed in evaluating achievement of water quality-based effluent limits). This will help to ensure that dischargers submit trading proposals that are well formulated and fully documented, and will facilitate the review of proposals by the permitting agency.

In addition, all parties will benefit if permitting authorities clearly define procedures and standards they will employ in evaluating proposed trades, including the methods by which they will verify results of dischargers* water quality analyses. If these standards and procedures are articulated clearly, both the dischargers* transaction costs and permitting authorities* administrative costs can be kept to a minimum. To the extent that permitting authorities incur additional administrative costs resulting from trading, they can examine opportunities to recover those expenses.

Trade Timing, Frequency, and Duration

An additional administrative issue is the establishment of conditions governing the timing, frequency, and duration of trades. One option that would help to reduce transaction costs is to tie trading to the permitting authority*s standard permit renewal cycle (e.g., every 5 years). This might be particularly attractive to permitting authorities that move toward watershed permitting strategies that synchronize the permit development process for all dischargers in a geographic region.

In addition, transaction costs may be minimized by tying the duration of trades to the duration of the involved dischargers* permits. Notably, the CWA currently prohibits permit terms of greater than 5 years. Granting trades the longest possible term would help dischargers to predict accurately the value of acquiring or selling discharge credits, and to make investments in pollution control accordingly.

As discussed in Chapter 2, trades may occur outside the TMDL process where permits are revised to adjust effluent limits and add permit conditions needed to comply with trading principles. Tying trading to a permitting authority's standard permit renewal cycles offers advantages to both the permitting authority and dischargers. For this reason, EPA encourages dischargers interested in trades to submit proposals at least a year before their permit expires.

Consideration of trading proposals submitted in between permit cycles will be at each permitting authority*s discretion. Reopener clauses provide opportunities to accommodate dischargers that negotiate a trade after permit limits are issued by reopening participating dischargers* permits and incorporating revised limits. A disadvantage of this approach is the additional administrative burden on permitting authorities.

Nonetheless, the potential benefits of trading might justify the additional administrative cost. This could be particularly true if trading provides a means of accommodating growth, either to expand an existing facility or construct a new facility. In these circumstances, allowing expanding or new facilities to trade with dischargers that already hold permits might offer both a cost-effective means of controlling pollution and the regulatory flexibility needed to support regional economic growth, while still meeting the requirements of the CWA.

Steps to Encourage Trading

Permitting authorities or other groups can take a number of other steps to facilitate and encourage trading. For example, a permitting authority or third party could support the exploration of trading opportunities by forming a multiparty advisory committee or convening stakeholder forums. Alternatively, permitting authorities could take the lead by requiring negotiated solutions to pollution problems, which might include trades, as in the case of South San Francisco Bay (see Exhibit 5.1).

Actively engaging stakeholders at early stages will ensure that processes fairly consider all legitimate interests, fostering the development of trading proposals that are likely to receive broad support. In addition, the involvement of stakeholders might help to identify additional trading opportunities, and can provide a forum for identifying and overcoming potential obstacles to trading.

Another means of encouraging trading is providing dischargers with information relevant to possible trades. While most of this information is already publicly available, its organization into a useful and easily understood format would help dischargers that could legitimately benefit from trading to identify and pursue their opportunities more efficiently. For example, permitting authorities or interested third parties could develop and make available readily accessible databases listing point sources on a stream segment or within a potential trading zone, including data on the type and quantity of pollutants discharged, current or proposed permit limits, and relative water quality impacts.

The experience with tradable effluent allowances on the Fox River described in Exhibit 5.2 emphasizes the importance of designing a trading program in a way that will facilitate trades and what happens when a trading program is not well structured.

Permitting authorities also could provide information from past water quality studies that would allow dischargers to develop better trading strategies and improve the focus of their water quality analyses. Such information would save dischargers time and effort in investigating trading opportunities and identifying potential trading partners. Outside parties could also provide dischargers technical assistance in developing trading strategies. For example, an independent broker could work directly with a group of dischargers in performing a water quality study for a proposed trade or could act as an intermediary in negotiating a trading arrangement.

Steps like these could improve the efficiency of the negotiating process and further reduce transaction costs. While not essential in all cases, they could increase the likelihood that the potential benefits of

EXHIBIT 5.2: LEARNING FROM THE FOX RIVER EXPERIENCE

In a 1981 effort to reduce pollution in the Fox River, the state of Wisconsin initiated a point/point source trading program, focusing on the discharge of BOD by 15 industrial and 6 municipal facilities. A preliminary analysis suggested that trading of BOD allowances could lead to annual savings of up to $6.8 million. To date, however, only one trade has taken place, in which a paper mill closed its wastewater treatment plant and asked the state to shift its allocation to the municipal treatment plant that began treating its wastewater. The full predicted economic benefits of trading have not been realized.

Several factors might have limited the success of point/point source trading on the Fox River. For example, many of the industrial facilities eligible to participate in the program are paper mills. Competitive pressures within the paper industry might dampen willingness to trade between facilities. In addition, some researchers suggest that the potential cost savings from trading on the Fox River represent such a small share of total paper production costs (less than 1 percent) that corporations have little incentive to invest management time in negotiating trades. Moreover, Wisconsin staff believe that the facilities generally have been reluctant to "trade away" part of their BOD load allocation since many believe they will need the full allocation to accommodate future growth.

In addition to these factors, there are significant administrative impediments to trading under the Fox River program. In particular, dischargers are not allowed to trade unless they demonstrate need; i.e., they may trade if a plant is increasing production or is unable to achieve discharge limits using the treatment systems currently in place, but cannot trade solely to reduce treatment costs. Relaxing this constraint, as well as taking other steps to facilitate trading, could have had a substantial beneficial effect on the trading program.

Source: *The Benefits and Feasibility of Effluent Trading Between Point Sources: An Analysis in Support of Clean Water Act Reauthorization*, prepared for the Offices of Water and Policy, Planning, and Evaluation, USEPA, September 1993.

trading, both economic and environmental, would be realized.

5.7 Accountability and Enforcement

Incorporating results of point/point and intra-plant trades into NPDES permit limits ensures that permittees are accountable for compliance and creates a clear administrative mechanism for enforcement. Information on effluent limits that would have been issued without trading should be included in the fact sheet accompanying permits. As with any standard NPDES permit, permittees would be responsible for compliance with all permit conditions, including monitoring, record-keeping, and reporting. Violating permits might subject violators to administrative, civil, or criminal action. Exhibit 5.3 illustrates the development of a cumulative limit for a group of dischargers involved in a trade.

A potential concern of state and regional enforcement officials is that point source dischargers could prolong trading negotiations to postpone compliance with permit limits. To avoid this problem, permitting authorities can establish deadlines for trading proposals—for example, asking that a proposed trade be

submitted for an authority*s review a year before an existing permit expires. If no proposal is received by the deadline, the permitting authority can begin standard review procedures for the purpose of issuing a new permit. The assurance that a conventional permit will be issued if trading negotiations become prolonged should provide an incentive for expeditious resolution of negotiations and a guarantee that dischargers will conduct such negotiations in good faith.

5.8 Worksheet/Checklist

The following checklist outlines key questions to consider in implementing a point/point source or intra-plant trading program.

EXHIBIT 5.3: USE OF THE BUBBLE APPROACH IN EPA REGION 2

For at least two waterbodies, Lake Champlain and Long Island Sound, EPA's Region 2 has established bubbles as part of setting discharge limits for selected point sources. Under this approach, New York State has issued nitrogen limits in permits for discharges within a defined geographic area—the bubble. A "group" permit contains a cumulative limit for all dischargers in the bubble, and individual permits contain limits for each discharger. As long as the cumulative limit is met, no action would be taken on individual performance. If the cumulative limit is exceeded, enforcement would be taken on a plant-by-plant basis based on the individual permits.

WORKSHEET FOR EVALUATING SUCCESS OF POINT/POINT SOURCE AND INTRA-PLANT TRADING

Legal and Regulatory Conditions	
General:	
• Will point sources and administrative agencies implement trading within the context of NPDES permits?	yes no
Specific:	
• Can point sources and administrative agencies include conditions in NPDES permits?	yes no
• Can administrative agencies specify effluent limits for each outfall, if necessary?	yes no
• Can administrative agencies include reopener clauses in permits to allow alterations to trading arrangements?	yes no
Economic Conditions	
General:	
• Can point sources save or make money by trading (i.e., are there economic incentives to trade)?	yes no
Specific:	
• Do point sources* total incremental costs for pollution reduction, which include direct incremental costs and transaction costs, differ among point sources or outfalls?	yes no
• Do cost differentials among point sources or outfalls allow one point source or outfall to reduce pollution more cheaply than another?	yes no
• Are transaction costs less than cost savings from the trade?	yes no
• Do cost savings from trading outweigh the uncertainties that point sources face under trading schemes?	yes no
• Is there a sufficient supply of pollution reduction for sale, as well as a reasonable demand to buy reduction credits among point sources?	yes no
• Are competitive pressures among dischargers subdued enough to allow trades?	yes no
Data Availability Conditions	
General:	
• Are the data necessary to implement a trading program among point sources available?	yes no
Specific:	
• Are there enough data to understand pollution quantities and flows within the watershed (e.g., water quality authorities have conducted a TMDL), including local impacts at specific outfalls?	yes no
• Can regulatory authorities monitor point source discharges and water quality under trading?	yes no
• Can point sources estimate their direct costs of reducing a specified unit(s) of pollution (direct incremental costs)?	yes no
• Can point sources estimate transaction costs that they would have to pay to conduct trades?	yes no

Administrative and Institutional Conditions	
General:	
• Are governmental authorities and point sources capable of administering a trading program?	yes no
Specific:	
• Do governmental authorities have enforcement mechanisms to ensure that point sources comply with NPDES permit conditions under trading arrangements?	yes no
• Is information about trading partners readily available so that buyers and sellers can coordinate?	yes no
• Are responsibilities clearly defined for institutions and point sources taking part in trading?	yes no
• Is the scope of the administrative infrastructure compatible with the amount and complexity of the trading that is expected?	yes no
• Do NPDES permits establish accountability for both water quality and pollutant reductions among point sources?	yes no